

EVALUATION OF AIRNET SAMPLER SITES AGAINST SITING CRITERIA

Purpose This Meteorology and Air Quality Group (MAQ) procedure describes the evaluation of Radiological Air Sampling Network (AIRNET) sampler sites against criteria for air flow obstructing trees and other potential obstructions.

Scope This procedure applies to the evaluation of all existing and new AIRNET sampler sites.

In this procedure This procedure addresses the following major topics:

Topic	See Page
General Information About This Procedure	2
Who Requires Training to this Procedure?	2
Description of Site Evaluation Criteria	3
Evaluation of a Sampler Site	5
Records Resulting from this Procedure	8

Signatures

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09/30/02

CONTROLLED DOCUMENT

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General information about this procedure

Attachments This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Control Plan	2
2	AIRNET Sampler Site Evaluation Form	1

History of revision This table lists the revision history and effective dates of this procedure.

Revision	Date	Description of Changes
0	10/11/95	New document.
1	2/22/00	Added HCP as attachment 1, added step to determine direction of source for the station.
2	8/30/02	Clarify responsibility for maintaining list of stations.

Who requires training to this procedure? The following personnel require training before implementing this procedure:

- personnel assigned to perform site evaluations

Training method The training method for this procedure is on-the-job training by a previously trained individual and is documented in accordance with the procedure for training (MAQ-024).

References The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
- DOE/EH-0173T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance"
- 40 CFR Part 58, "Ambient Air Quality Surveillance"

Note Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Description of site evaluation criteria

Site evaluation criteria

Refer to the following criteria (taken from DOE/EH-0173T and 40 CFR 58) when performing a site evaluation according to the steps in the following chapter.

NOTE: 40 CFR 58 applies to the establishment of air monitoring stations for “criteria pollutants” (e.g., SO_x, NO_x, CO, ozone, and particulates) and does not apply to monitoring radionuclides. As such, 40 CFR 58 was utilized as a guidance document only.

Criterion 1

Favorable surface characteristics: To reduce particulate loading of filters, sites must have minimal material that is prone to air suspension. Sites whose surfaces are stabilized and protected by ground cover vegetation, or sites that are located on solid rock, concrete, pavement, or gravel with minimal loose surface material, are considered acceptable. The potential for dust from nearby, unpaved roads and from excavation areas should be considered in evaluating the acceptability of a site.

Criterion 2

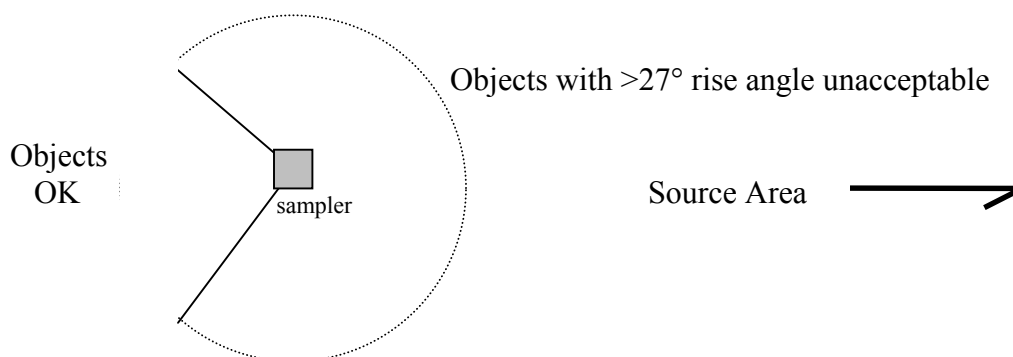
Acceptability of the location: According to 40 CFR Part 58, samplers “must be 10 m from the dripline when the tree(s) act as an obstruction.” If a sampler is greater than 10 m from the nearest tree dripline, then the location is considered acceptable. If the distance is 10 m or less, one of the following two conditions must be met:

- a. A tree is not considered an obstruction if the distance to the tree dripline is greater than two times the height the tree extends above the sampler (equivalent to a rise angle from the sampler to the top of the potential obstruction of approximately 27° or less).
- b. A tree is not considered an obstruction if it is located outside a 270° arc measured from the sampler location toward the specific source being monitored (40 CFR 58).

Description of site evaluation criteria, continued

Criterion 3 **Distance to obstructions (primarily buildings) greater than two times the height the obstruction extends above the sampler:** The distance between the sampler and the obstruction must be at least twice the height difference between the sampler and the obstruction (equivalent to a rise angle from the sampler to the top of the potential obstruction of approximately 27° or less). Concerns about whether an obstruction needs to be considered according to this distance/height criterion may be addressed below according to criterion #4.

Criterion 4 **Unrestricted airflow in 270° arc around the sampler:** An object (excluding trees, which are addressed in criterion 2) is not considered an obstruction if all parts of the object are outside a 270° arc measured from the sampler location toward the source(s) being monitored (40 CFR 58).



Criterion 5 **Good topographic location:** The ideal location is a flat surface. Sites within topographic depressions should be evaluated according to criteria #3 and #4 above to determine if the depression itself obstructs airflow to the sampler. If a site meets these criteria, it is acceptable. No criteria specific to locating samplers near topographic depressions were found. In the LANL area, several samplers are located on the edges of canyons. Although there are presumably airflow effects associated with this type of location, no regulatory criteria apply and the acceptability of these stations is based on scientific judgment.

Evaluation of a sampler site

Evaluation of new sampler sites

New AIRNET sampler sites may be required due to changes in property availability, sampling needs, or site conditions.

Evaluate all proposed new sites against the siting criteria in the previous chapter by following the numbered steps below.

When to evaluate AIRNET sampler sites:

- New sites: Evaluate all new candidate sites before finalizing the location.
- EPA compliance stations: Re-evaluate bi-annually when leaves are out on trees and bushes.
- Non-compliance stations: Re-evaluate on as-needed basis, as resources allow. Perform evaluations when leaves are out on trees and bushes.

Steps to evaluate site

To evaluate a proposed site, perform the following steps:

Step	Action
1	Obtain the following supplies: <ul style="list-style-type: none"> • compass (with declination correction) • an instrument for measuring vertical angle (e.g., Silva compass with inclinometer) • 30 m (100 ft.) tape measure • engineer scale • AIRNET Sampler Site Evaluation form(s) (Attachment 1).
2	Determine the direction or location of the source for the site. Confer with the project leader or other AIRNET personnel as needed.
3	At the site, describe surface characteristics on form. Determine whether site is acceptable per this criterion and record on form.
4	If there are trees or other vegetation at or above the height of the sampler, determine whether the driplines from any are within 10 m of the sampler. If not, indicate that trees are acceptable on the form and skip to step 5. If tree driplines are within 10 m, measure the direction and distance to the trees, and record locations on the evaluation form and plot on the site map. Proceed with step 5.

Steps continued on next page.

Evaluation of a sampler site, continued

Step	Action
5	Measure the vertical angle between the top of the sampler and the top of trees and other objects. If this angle is less than 27° for each object, then indicate that objects are acceptable on the form. If the angle is greater than 27° for any object, determine if the object is within the 270° arc containing the source and the prevalent wind direction as described in criterion 4 and record the angle on the evaluation form. If any of the objects whose vertical rise angle was greater than 27° fall within this arc, then objects are unacceptable and this should be indicated on the form. Otherwise, indicate that the objects are acceptable.
6	Describe the topography of the site, indicating approximate distances and directions to significant topographic features. If the site is in a depression deeper than the height of the sampler, record the vertical rise angle to the top of the depression. If angle is greater than 27°, then the site identify as unacceptable under the topography criterion.
7	If the site is unacceptable under any criterion, survey the area to see if a better site is nearby and record observations or recommendations.

Judgement in applying criteria

Uniform application of the criteria is important to ensure consistency and adequacy among air sampler locations. However, it may not be possible to site a sampler to meet all criteria listed. Good scientific judgement will be used to select the optimal location based on site-specific criteria and on specific sampling needs.

An example is Station # 60 located in Los Alamos Canyon, up-canyon from TA-41 and TA-2. The intent of this station is to monitor the potential up-canyon dispersal of radioactivity from TA-41 and TA-2 toward potential receptor locations at the Ice Skating Rink. The sampler must be located at the bottom of the canyon between the source area and the potential receptors. In the bottom of the canyon, the canyon walls are considered obstructions according to criteria #3 and there are extremely few locations where trees would be considered acceptable according to criteria #2. At this site, the specific need for the station outweighs the site-specific criteria and the sampler was sited to best provide the data required.

File evaluation form

File the completed site evaluation form with the records coordinator.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted as records to the records coordinator:

- AIRNET Sampler Site Evaluation Form

HAZARD CONTROL PLAN

1. The work to be performed is described in this procedure.

“Evaluation of AIRNET Sampler Sites Against Siting Criteria”

2. Describe potential hazards associated with the work (use continuation page if needed).

Falls/tripping

Animal Injuries- (snakes, spiders, mountain lions, etc.)

Weather -- Lightning

High Explosives testing (TA-15, TA-16, TA-49)

Radiation Areas (TA-54-Area-G, TA-16)

3. For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, as determined according to LIR300-00-01.0, section 7.2)

Falls/tripping -- Moderate/Occasional = Minimal

Animal Injuries -- (snakes, spiders, mountain lions, etc.)--Critical/Remote = Minimal

Weather -- Lightning -- Catastrophic/Remote = Low

High Explosives testing (TA-15, TA-16, TA-49)--Critical/Remote = Minimal

Radiation Areas (TA-54-Area-G, TA-16) -- Negligible/Remote = Minimal

Overall *initial* risk: ☐ Minimal ☒ Low ☐ Medium ☐ High

4. Applicable Laboratory, facility, or activity operational requirements directly related to the work:

☐ None ☒ List:

Work Permits required? ☒ No ☐ List:

LIR 402-7-6-01 "Personnel Dosimetry"

LIR 402-718-01 "Radiological Training"

Access Control Requirements for TA-15, TA-16, TA-49, TA-54

HAZARD CONTROL PLAN, continued

5. Describe how the hazards listed above will be mitigated (e.g., safety equipment, administrative controls, etc.):

Falls/tripping – the "Employee Orientation" includes training and awareness of tripping and falls.

Animal Injuries – same as above.

Weather (lightning) – same as above.

Entry into High Explosives testing areas – existing controls are stringent and not easily bypassed.

Existing facility controls include site specific training, sign-in/sign-out, and scheduling procedures.

Entry into posted Radiation/Controlled Areas – TA-54-Area-G and TA-15 controls are stringent and not easily bypassed – Area-G and TA-15 require entry through manned access control gates.

6. Knowledge, skills, abilities, and training necessary to safely perform this work (check one or both):



Group-level orientation (per MAQ-032) and training to this procedure.



Other → See training prerequisites on procedure page 3. Any additional describe here:

7. Any wastes and/or residual materials? (check one) ☒ None ☐ List:
(Used filter media or analytical residue is disposed by the analytical laboratory.)

8. Considering the administrative and engineering controls to be used, the *residual* risk level (as determined according to LIR300-00-01.0, section 7.3.3) is (check one):



Minimal



Low



Medium (requires approval by Division Director)

9. Emergency actions to take in event of control failures or abnormal operation (check one):



None



List:

Signature of preparer of this HCP: This HCP was prepared by a knowledgeable individual and reviewed in accordance with requirements in LIR 300-00-01 and LIR 300-00-02.

Preparer(s) signature(s)

Name(s) (print)

/Position

Date

Signature by group leader on procedure title page signifies authorization to perform work for personnel properly trained to this procedure. This authorization will be renewed annually and documented in MAQ records.

Controlled copies are considered authorized. Work will be performed to controlled copies only. This plan and procedure will be revised according to MAQ-022 and distributed according to MAQ-030.

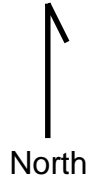
Meteorology and Air Quality Group

AIRNET SAMPLER SITE EVALUATION FORM

This form is from MAQ-207

Part 1 Site Map

Station name: _____ Station number: _____



Part 2 Comments If any criterion is unacceptable, indicate whether station requires relocation or provide rationale for leaving in present location. Attach additional sheets if needed.

Part 3 Final Evaluation

Surface characteristics acceptable	Y	N
Trees acceptable	Y	N
Other potential obstructions acceptable	Y	N
Topography acceptable	Y	N

If any criteria are unacceptable, indicate proposed action in Comments section.

Evaluator signature

Name (print)

Date

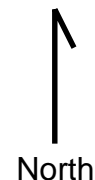
Preparer: Submit completed form to records coordinator.

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